

Rebuilding carbon and soil health

Dairy farmers need to face up to the consequences of increased intensity of cultivations and artificial nitrogen applications which have contributed to a reduction in soil carbon and organic matter. Focussing on soil health is one area of sustainable production that can bring big benefits in crop yields and fertiliser use.



Alistair Hugill

The majority of dairy farmers grow arable crops and maize for forage. Improving soil health is becoming increasingly important for long-term and sustainable production of these crops. Adding sources of carbon direct to soils at crop establishment and to the growing crops can play a significant role in replenishing soil organic matter and improving soil health.

Approaches such as reduced cultivations and min till or no till are being taken up to try and reduce the degradation of organic matter. Now a unique range of soil and crop nutrition supplements based on sustainable molasses will help farmers achieve cost-effective performance improvements while optimising traditional chemical inputs across a range of crops.

The ED&F Man Agronomy range of liquid carbon products comprises four products that are high in carbon and sugars from sustainable sources complemented with a range of other micro-nutrients including amino acids, enzymes, polysaccharides, fatty acids, organic glutamine, and bioactive peptides.

The concept has been developed over the last 10 years and has been shown to be beneficial for cereals, root crops and maize across a broad spectrum of soil types.

“They can help improve soil fertility and crop growth in a sustainable way and reverse some of the problems resulting from declining soil health,” explains the company’s Alistair Hugill. “Reduced soil carbon and lower levels of organic matter compromise crop yields. It is therefore important to rebuild soil organic matter and promote more efficient nutrient uptake for more profitable and sustainable production.”

Research has shown that increasing the supply of readily available energy to the soil microbiome is an effective way to stimulate soil biology, increasing the activity of fungi and protozoa as well as bacteria. Additionally, increasing the supply of carbon will help to improve the soil’s physical and chemical properties.



Liquid carbon can be applied with liquid fertilisers

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“There has always been a symbiotic relationship between plants and the soil,” explains Alistair. “Plants provide carbohydrates and carbon to the soil in the form of root exudates, effectively a sugar/carbon solution for the microbes. In return, the microbes and organic acids increase the rate at which mineral nutrients in the soil are dissolved, increasing their availability to the plant.

“Plants produce carbohydrates via photosynthesis, and any surplus is excreted as root exudates to feed the soil microbiota. When performing well a plant will provide 40% of the products from photosynthesis containing carbon and sugars into the soil.

“If we feed the plant directly with a source of sugar and carbon, it can meet its demand for carbohydrates for

growth more efficiently and it will still photosynthesize at the same rate. This means the production of available root exudates increases, supporting a healthier soil microbial population and in turn increasing nutrient supply to the plant.

ED&F Man Agronomy liquid carbon products are formulated for soil and foliar application and can be included in tank mixes, either with liquid fertilisers or agrichemicals and growth promoters, meaning they can be applied without additional crop passes, avoiding extra application costs. Filtered to 200 microns, they are suitable for use in the majority of spraying systems typically at around 2-5 litres/ha depending on the crop. The high carbohydrate content stimulates microbial populations in the organic layer and drives microbial activity

As a soil application around the seed, they provide a feed and carbon source to increase soil bacteria which in turn encourages stronger rooting and better crop establishment. The increased carbon supply also helps maintain and build carbon levels in the soil. Foliar applications during the season help increase the supply of exudates to the roots to maintain the flow of nutrients from bacterial activity.

“We are now seeing significant benefits from the focus on soil health,” Alistair continues. “We are seeing improved root development which has helped plants develop strongly. Crops are better able to withstand the effects of frost and recover more quickly after any periods of drought.

“By increasing the availability of soil nitrogen it might be possible to achieve the same yields with a reduced nitrogen application. However, it might be more efficient keeping applications the same and increasing total supply to the crop and improving nitrogen use efficiency and carbon capture from a larger crop.

“As dairy farmers who grow cereals and maize look to improve the sustainability of their farming systems, it will pay to take a closer look at soil health,” Alistair concludes.